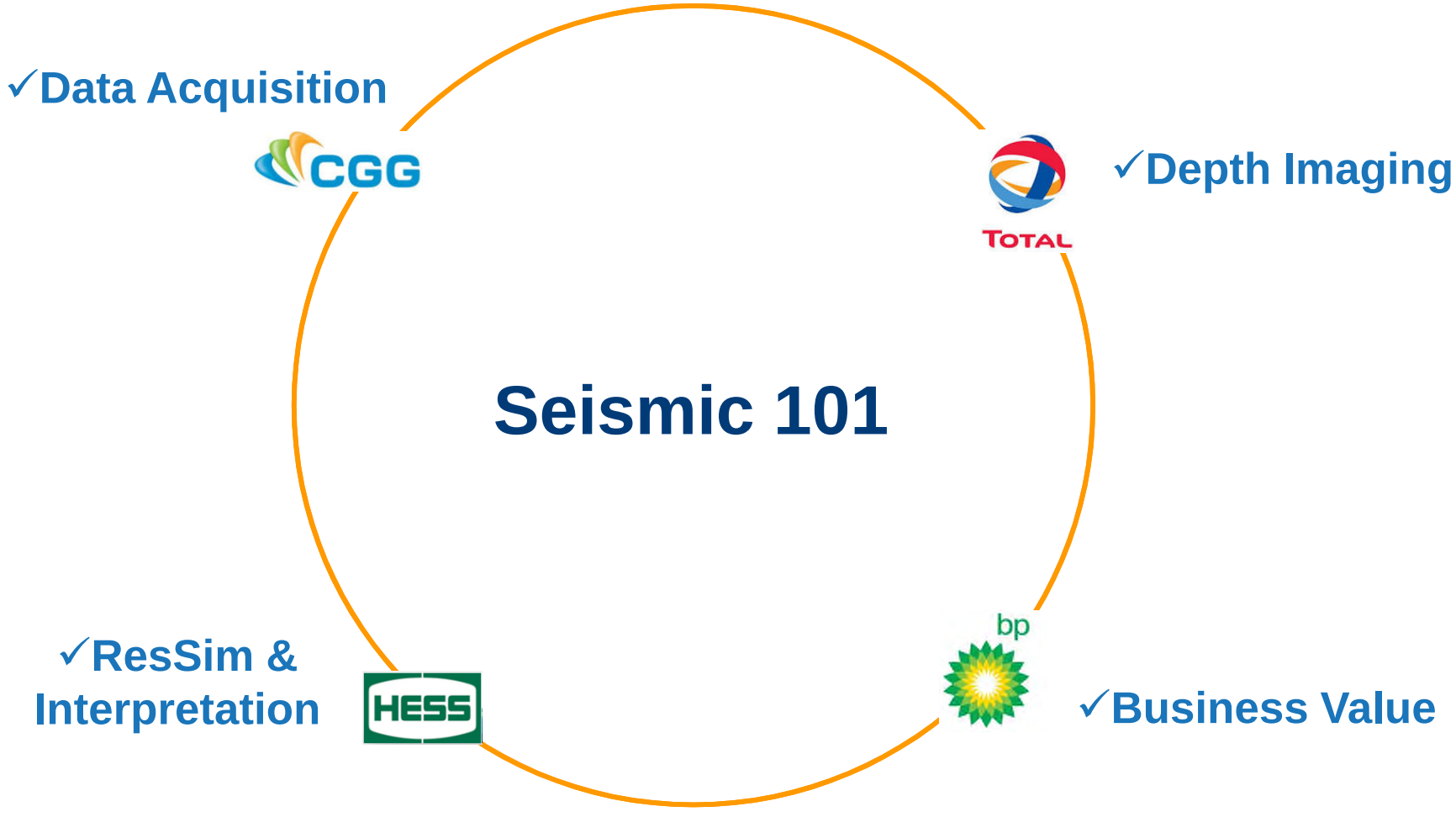
AGENDA: SHARED TOPIC

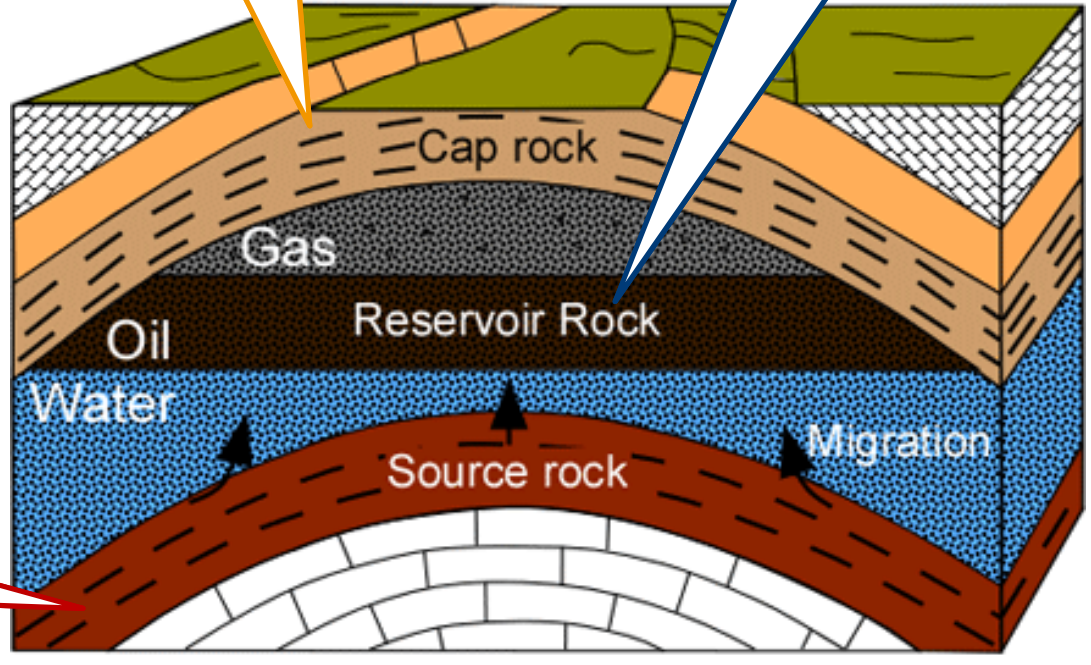


EARTH IMAGING: GEOLOGY

At about 60 degrees Celsius, oil begins to form in the source rock due to the thermogenic breakdown (cracking) of organic matter (kerogen).

The *oil window* is a temperature dependant interval in the subsurface where oil is generated and expelled from the source rocks. The oil window is often found in the 60-120 degree Celsius interval (aprox. 2-4 km depth), while the corresponding *gas window* is found in the 100-200+ degree Celsius interval (3-6 km depth).

After expulsion from the source rock, the oil/gas (lighter than water) migrates upwards through permeable rocks (sandstones) or fractures until they are stopped by a tight, non-permeable layer of rock, like a shale. If hydrocarbons get trapped in a subsurface, geological structure, they may be produced from a hydrocarbon accumulation (reservoir) through an oil well. If not trapped, the hydrocarbons may eventually migrate up to the surface, where they can be seen as seeps.



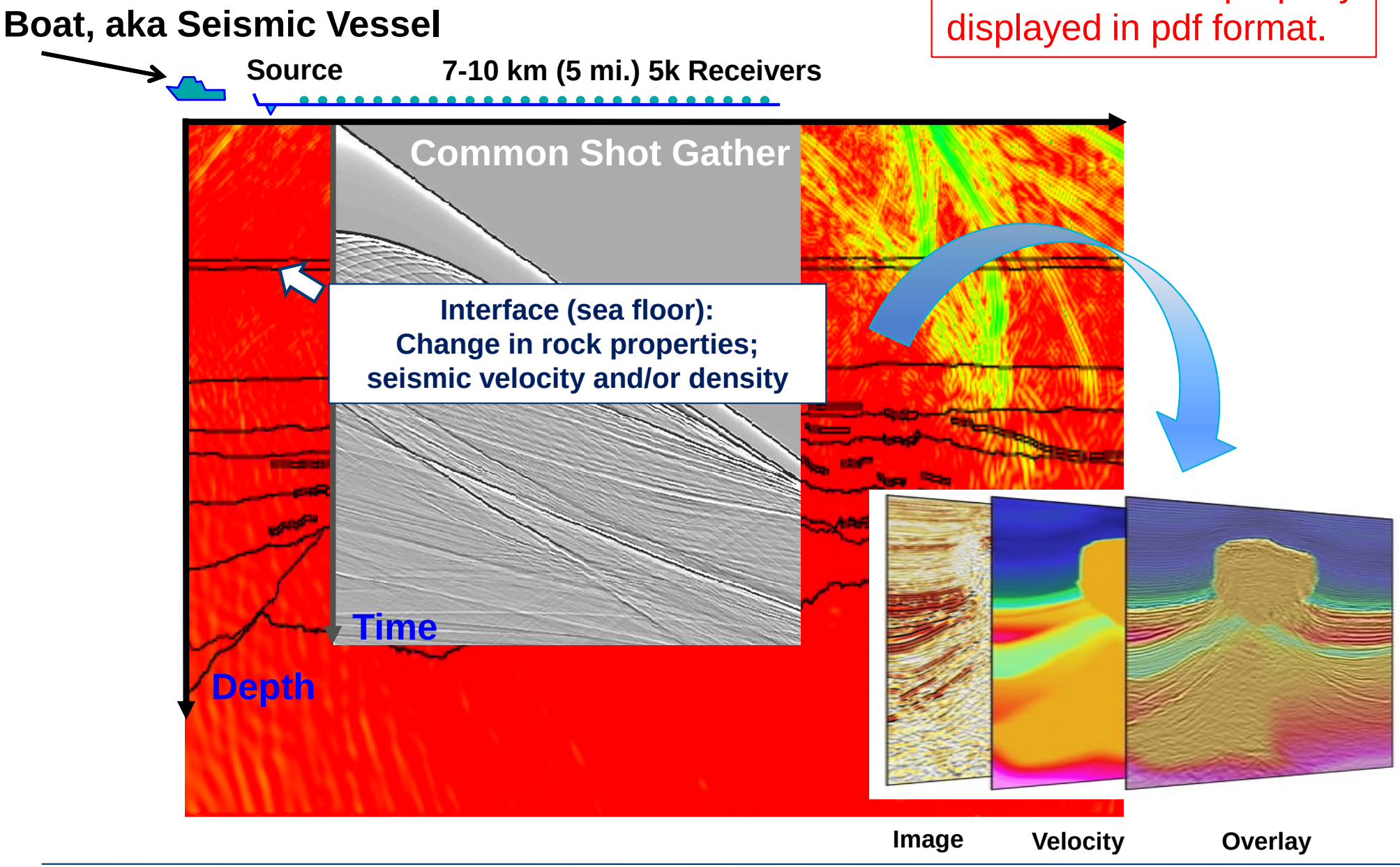
Anticline Trap

References: http://petroleum101.com
http://oilandgasgeology.com

TOTAL

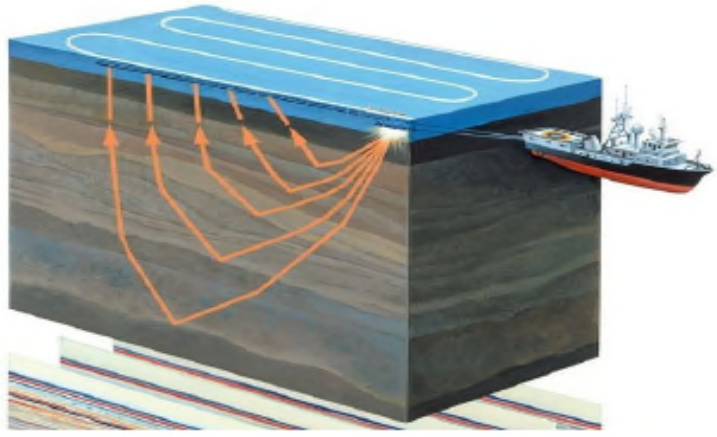
EARTH IMAGING: WAVE PROPAGATION

Video will not be properly displayed in pdf format.

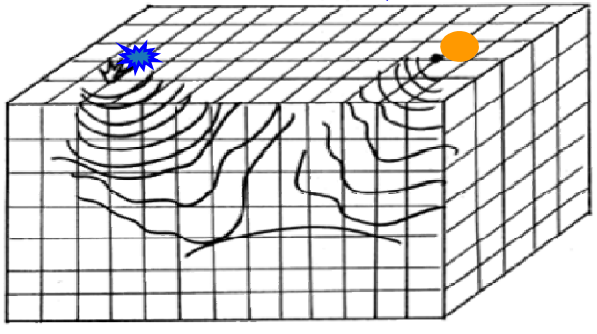


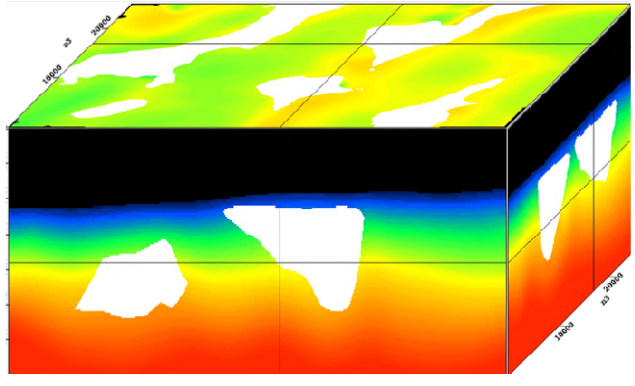
TOTAL

EARTH IMAGING: PROCESSING



= Migration (Data, Model)





HPC + Numerical Methods

TOTAL

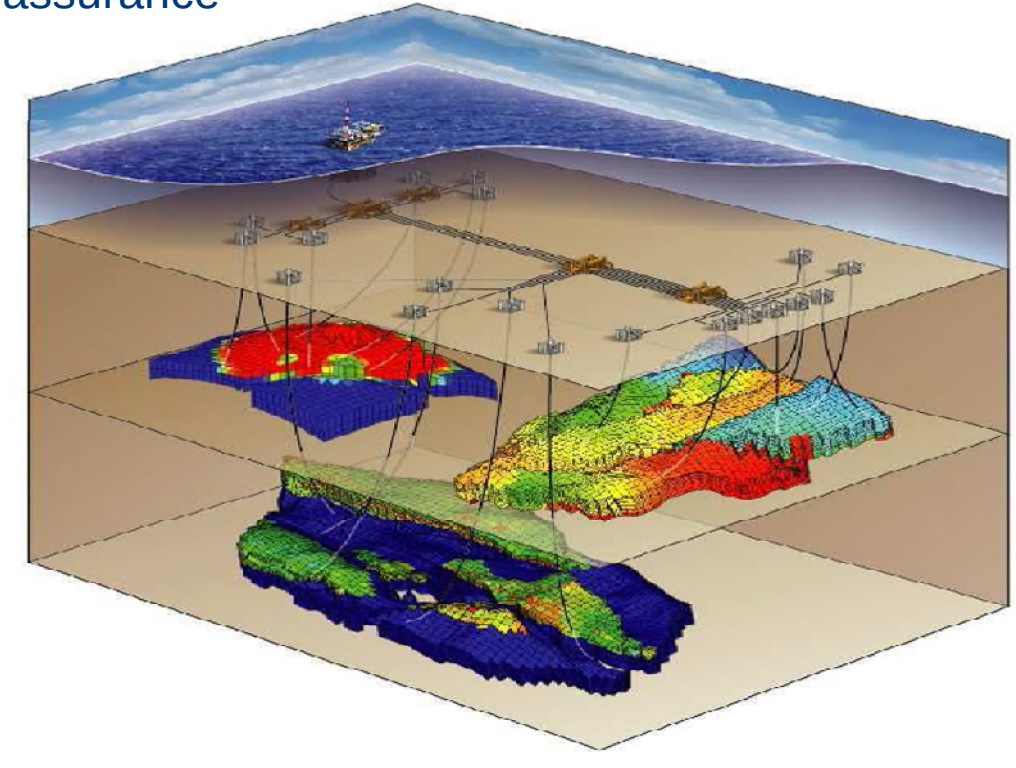
INTERPRETATION & RESERVOIR SIMULATION

❑ Interpretation

- ✓100s to 1,000s of technical computing workstations
- ✓A plethora of applications and utilities in the workflow

❑ Reservoir Simulation

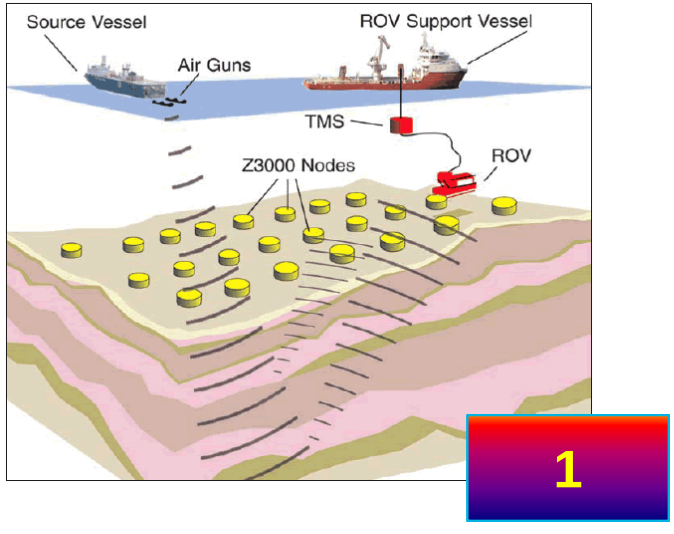
- ✓Well behavior prediction and flow assurance
- ✓Tight coupling to memory
- ✓Weak scaling
- ✓Toward large Giga-models

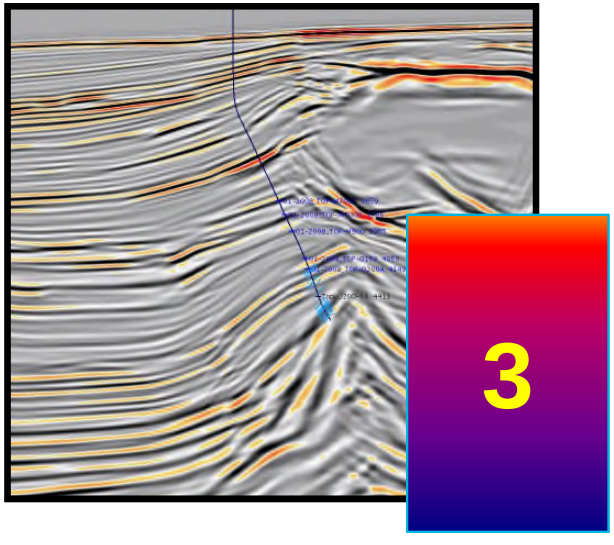


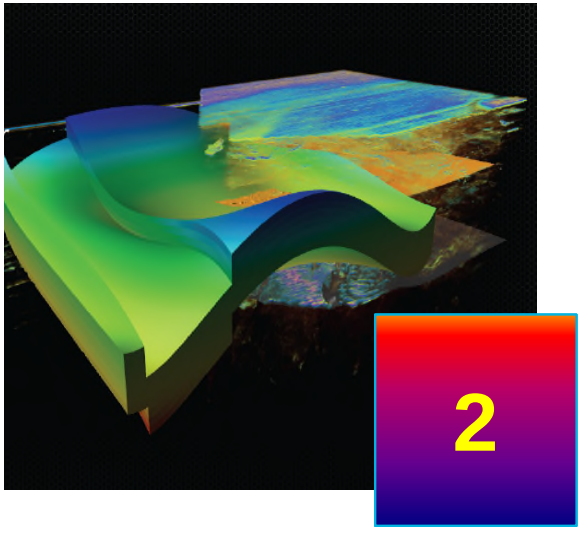
References:
http://devblogs.nvidia.com/parallelforall/wp-content/uploads/sites/3/2014/05/OilReservoir.png

HPC TRENDS & NEEDS FOR OIL & GAS UPSTREAM

- **Acquisition: Order of Magnitude**
  - ✓Increased, Denser, Multi-component, 4D …Data
- **Imaging: up to 3 Orders of Magnitude**
  - ✓More… Physics, Iterations, Models, Complex Approximations
- **Simulation: up to 2 Orders of Magnitude**
  - ✓Higher, Multi… Resolutions & Interactions with the Data







TOTAL

GET PLUGGED INTO THE HPC O&G COMMUNITY

2016 Rice Oil & Gas HPC Conference

March 2-3, 2016

BRC, Rice University

Call for Abstracts

Abstracts due Tuesday, November 24th.

TOTAL